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think would be of most use to a young man placed in the same position as "Ambitious" is. First, an encyclopædia is indispensable, and we name

"Gwilt's," as being the best, price	$20 00
"Warren's Drafting Operations."	1 25
" Freehand Drawing."	1 00
"Riddell's Lessons in Hand-railing."	5 00
" New Elements of Hand-railing."	10 00
" Artisan."	5 00
"Lakey's Village and Country Houses."	5 00
"Rosengarten's Architectural Styles."	3 00
"Progressive American Architecture."	6 00
"Vogdes' Prise Book."	1 50
"Scribner's Mechanic's Companion."	1 50
"Ames' Alphabets."	1 50
Total	$60 75

Of course, this does not include the AMERICAN BUILDER, as that journal is supposed to be taken regularly by every wide-awake carpenter and builder in the land. The books enumerated above cover the ground "Ambitious" seeks to travel very fairly, though forty dollars more, as judiciously expended, would procure him a library sufficient for all his requirements, provided he subscribes for all the building journals issued in the country. —EDITOR.

42. NAILS.—"Anxious" can find the desired information in "Tredgold's Carpentry," by Hurst.

The following experiments were made by Mr. Bevan. He says, the progressive depths of sixpenny nail into dry Christiana deal by simple pressure across the grain was as follows:

¼ of an inch	24 lbs.
½ of an inch	76 "
1 inch	235 "
1½ inch	400 "
2 inches	610 "

To extract a sixpenny nail from a depth of one inch (1″) out of dry oak required a force of 570 lbs.; dry elm, 327 lbs.; dry beech, 667 lbs., and green sycamore, 312 lbs. Owing to the taper in nails the resistance to entrance becomes of necessity greater than that of extraction, the ratio was found to be about six to five. The same nail driven edgeways into dry elm one inch required a force of 257 lbs. to extract it, and driven endways into dry Christiana deal one inch required a force of 87 lbs. to extract it. The relative adhesion therefore in the same wood when driven across, or with the grain of the wood, is about four to three for dry elm and about two to one for deal.

It was found by Mr. Bevan that the force required to cause sliding or complete separation in the plane of the joint of the two pieces of Christiana deal, each seven eighths of an inch thick, when nailed together with two sixpenny nails, was 712 lbs.; the same for dry oak one inch thick, 1009 lbs.; the same for dry sound ash, 1420 lbs.

The same author has given us valuable information on the adhesion of screws. With a screw two inches in length, $\frac{22}{100}$ of an inch in diameter at the exterior of the threads $\frac{15}{100}$ of an inch in diameter at the bottom, the depth of the thread being $\frac{35}{1000}$ of an inch, and the number of threads = 12. The screws were passed through pieces of wood exactly one half inch in thickness, and were drawn out by the weights specified in the following table:

Dry Beech	790 lbs.	Dry Mahogany	770 lbs,
Dry Sound Ash	790 "	Dry Elm	655 "
Dry Oak	760 "	Dry Sycamore	830 "

The weights were supported about two minutes before the screws were extracted, the force required to draw similar screws out of softer woods is estimated at about one half the above.

A common screw of one-fifth of an inch in diameter was found to have an adhesion of about three times that of a sixpenny nail.—ENQUIRER.

We solicit early answers from our subscribers to the following "Queries," made in previous issues, and which, so far, have not been answered:

No. 15.—CORNER CUPBOARD.
" 15.—EMBLEMS.
" 16.—SECRETARY.
" 17.—CROCKETT'S PRESERVATIVE.
" 20.—RAILING.
" 30.—STAIR CYLINDER.
" 33.—HOWE TRUSSES.
" 34.—COTTAGE.
" 35.—PLOUGH.
" 39.—CUPBOARD.
" 41.—COMMUNION TABLE.

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Clamping Picture-Frames.

AN excellent arrangement for fastening the corners of picture-frames can be made in a few minutes which will be all that can be desired and answers admirably in the case of frames that will not bear marring on the edges. Take a piece of wood 9 or 10 inches long, and 2½ square, and rebate one angle 1¼ inches deep and wide, then round off the opposite angle, and cut the piece into four pieces of equal length. Having accurately mitred the frame, lay it upon the bench and put one of the pieces of wood at each corner, the rebate, of course, fitting upon the angle, and wind a piece of quarter-inch cord twice around the frame over the corner pieces, and tie it at one corner.

Now take four pieces of smooth wood 6 inches long and twice as thick as a carpenter's pencil, insert them between the cords, one on each side of the frame, and by twisting the cord with them it can be made as tight as desired; and having seen that the mitres are good, and the frame does not wind, lay it upon the bench and pull out the bits of wood without disturbing the cord or corner pieces, lift out the frame, put a little glue upon the mitres, and replace as quickly as possible in the same position as it was before, replace the pieces of wood and give the cord a few turns, adjust the angles and tighten up. Braces can then be put across the corners on the back of the frame, or, where the edges will admit, a saw kerf can be made in the corners and a piece of veneer glued in.—*American Inventor.*

Useful Items for Office and Shop.

A cement for such purposes as fixing metal letters to glass windows consists of copal varnish, fifteen parts; drying oil, five parts; turpentine, three parts; oil of turpentine, two parts; liquefied marine glue, five parts. Melt in a water-bath, and add ten parts dry slaked lime.

Cement for Steam Joints.—Take salammoniac, two ounces; sublimed sulphur, one ounce; fine cast-iron turnings, one pound; mix in a mortar, and keep dry. When to be used, mix with twenty times its quantity of clean iron turnings or filings, and triturate the whole in a mortar; then wet with water until of proper consistence. A red putty for steam joints can be made of stiff white lead worked well in red-lead powder.

Waterproof Paper.—Sheets of stout manila passed through a hot bath of aqueous solution of zinc chloride (at 75° B.), pressed strongly together and then soaked in dilute aqueous soda solution containing a small amount of glycerine, cohere to form a strong, stiff, waterproof board admirably adapted to the construction of small boats. Single sheets of paper passed quickly through the zinc chloride bath, pressed and washed and dried, are waterproof, and may be otherwise joined to form waterproof boards by any suitable cement.

Imitation Ebony.—The following recipe, which we take from the *Revue Industrielle,* will answer numerous correspondents who have inquired how to turn oak black so as to cause it to resemble ebony. The wood is immersed for forty-eight hours in a hot saturated solution of alum, and then brushed over several times with a logwood decoction, prepared as follows: Boil one part of best logwood with ten parts of water, filter through linen, and evaporate at a gentle heat until the volume is reduced one half. To every quart of this add from ten to fifteen drops of a saturated solution of indigo, completely neutral. After applying this dye to the wood, rub the latter with a saturated and filtered solution of verdigris in hot concentrated acetic acid, and repeat the operation until a black of the desired intensity is obtained. Oak thus stained is said to be a close as well as handsome imitation of ebony.

Imitation Rosewood.—A concentrated solution of hypermanganate of potassa is spread on the surface of the wood, and allowed to act until the desired shade is obtained. Five minutes suffice ordinarily to give a deep color. A few trials will indicate the proper proportions. The hypermanganate of potassa is decomposed by the vegetable fibres with the precipitation of brown peroxide of manganese, which the influence of the potassa, at the same time set free, fixes in a durable manner on the fibres. When the action is terminated, the wood is carefully washed with water, dried, and then oiled and polished in the usual manner. The effect produced by this process on several woods is remarkable. On the cherry, especially, it gives a beautiful red color. The color resists well the action of air and light, and the process seems very simple.

Drawings for the Million.

The complete clearing out of our "Detail Sheets" has encouraged us to offer the following packages of valuable drawings for sale, at the extremely low price of one dollar a package.

Each package will contain over two hundred designs, with all the necessary explanations and descriptions; also, a valuable amount of building information, consisting of tables, rules, recipes, price-lists, etc., etc. Three of these packages bound together will make a very useful work of reference for the architect, builder, carpenter, joiner, or any one connected with the building trades:

Three packages will be sent to one address for...	$2 50
Six packages for.....	4 50
Or the whole eleven packages for....	8 00

Package No. 1 contains 238 designs of cottages, dormer-windows, verandas, consoles, barge-boards, porches, gates, doorheads, gables, chimney-tops, cornice and brackets, crestings, scroll-work, summer-house, eave brackets, stairs, full-sized sections of hand-railing, bay-window, wooden chairs, tables, writing-desks, perforated woodwork, fancy brickwork, doors, etc., etc. Price $1.

Package No. 2 contains 15 elevations with plans of cottages and villas, 3 elevations and plans of churches, also over 200 designs of piazzas, bay-window cornices, hood brackets, gable triangles, chimney caps, crestings, window-caps, trusses, dormers, doors and frames, porches, corner finish, canopies, cornice arch, screens, gutters, brick and wood work, beltings, stair-balusters, newel-posts, flues, etc., etc. Price $1.

Package No. 3 contains 39 elevations and plans for cottages, villas and dwellings; 10 elevations and plans for churches; and 146 designs for brick and stone work, shipwork, half-timbered work, verandas, drawing lessons, windows, doors, etc., etc.; also 26 designs of cornices, panels, etc., for plasterers. Price $1.

Package No. 4 contains 51 plans and elevations for cottages, villas, barns, stables, and railway stations; also, 5 plans and elevations of churches; and 115 detail drawings of scroll-work, windows, bay-windows, gables, verandas, side finish, newel-posts, shipwork, general house details, bay-window frames, frieze cornices, balustrades, oriel window, fences, gates, vestibule and front door, open timber roofs, etc., etc. Price $1.

Package No. 5 contains 72 elevations and plans of cottages, city houses, banks, villas, and country houses; also plan and elevation of schoolhouse, and 125 detail drawings of desks, counters, doors, door finish, piazzas, gables, dormers, wainscoting, chimney-cases, ceilings, front gables, porches, verandas, timber roofs, crestings, towers, vanes, stairs, mantels, balusters, newels, grilles, cornices, gateways, railing, etc., etc.

This is an excellent package. Price $1.

Package No. 6 contains 38 plans and elevations of cottages, villas, and country houses; 3 plans and elevations of churches; and 135 detail drawings of fences, doors, windows, stairs, mantels, verandas, porches, stoops, carved work, gates, summer-house, newel-posts, balusters, wrought-iron work, chimney-tops, gables, examples of furniture, finials, bay-windows, dormers, hoods, arches, oriels, truncated gables, turned work, cornices, church furniture, counters, etc., etc.

Besides the above illustrative and necessary descriptive and explanatory matter, this package contains a series of illustrated papers on the use of the steel square. This package is an excellent one for carpenters and joiners who do work in the country towns, as the details are numerous and easily understood. Price $1.

Package No. 7 contains 44 plans and elevations of cottages and villas; 164 detail drawings of roofs, mantels, windows, doors, balconies, verandas, stairs, newels, piazzas, vanes, dormers, pews, church finish, chimneys, brickwork, porches, cornices, pinnacles, brick arches, etc., etc. There are also five plans and